

Appl. No. 09/981,226

23 April 2004

Reply to Office Action of 01/23/2004

COMMENTS ON THE SPECIFICATION

Paragraph 19 in the text (included below) of the specification clearly illustrates, defines and supports that the "ideal water velocity" is a constant. The ideal water velocity is a constant, a constant which is arbitrarily defined as is clearly illustrated by the text of the specification. As stated in the application, the invention provides a way to calculate and apply **"corrections that map the seismic data to an ideal case of constant water velocity."**

[0019] This invention removes the effects of variable water velocity by **calculating and applying corrections that map the seismic data to an ideal case of constant water velocity**. All of the corrections assume, from a separate analysis step, that the vertical (zero-offset) timing errors induced by the water-velocity variations and that the zero-offset water bottom times are available. Equivalently, the water velocities are assumed known. The timing errors and water velocities are related by equation 5 below. The zero-offset water-bottom times are also assumed available. **From this information, and an arbitrarily-defined "ideal" water velocity, it is possible to calculate an observed (actual) water velocity relative to the "ideal" case.** The only additional information needed is the angle of the ray path through the water layer. The angle may be calculated directly from normal moveout velocities derived from conventional analysis of the seismic data, and the information above. A time-dependent and offset-dependent correction may be derived for each sample of the seismic data prior to normal move out correction.

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